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FIG.1

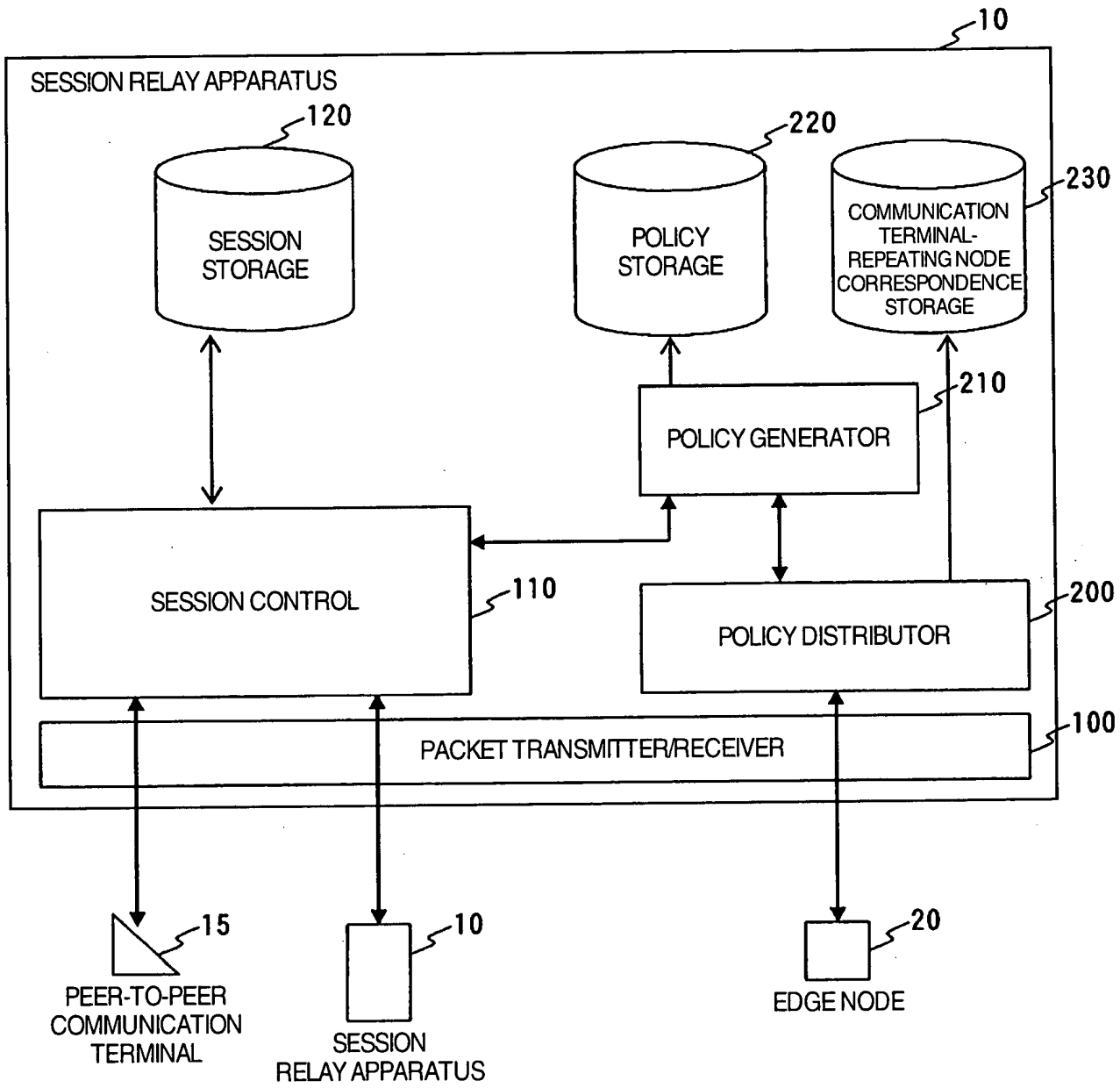


FIG.2

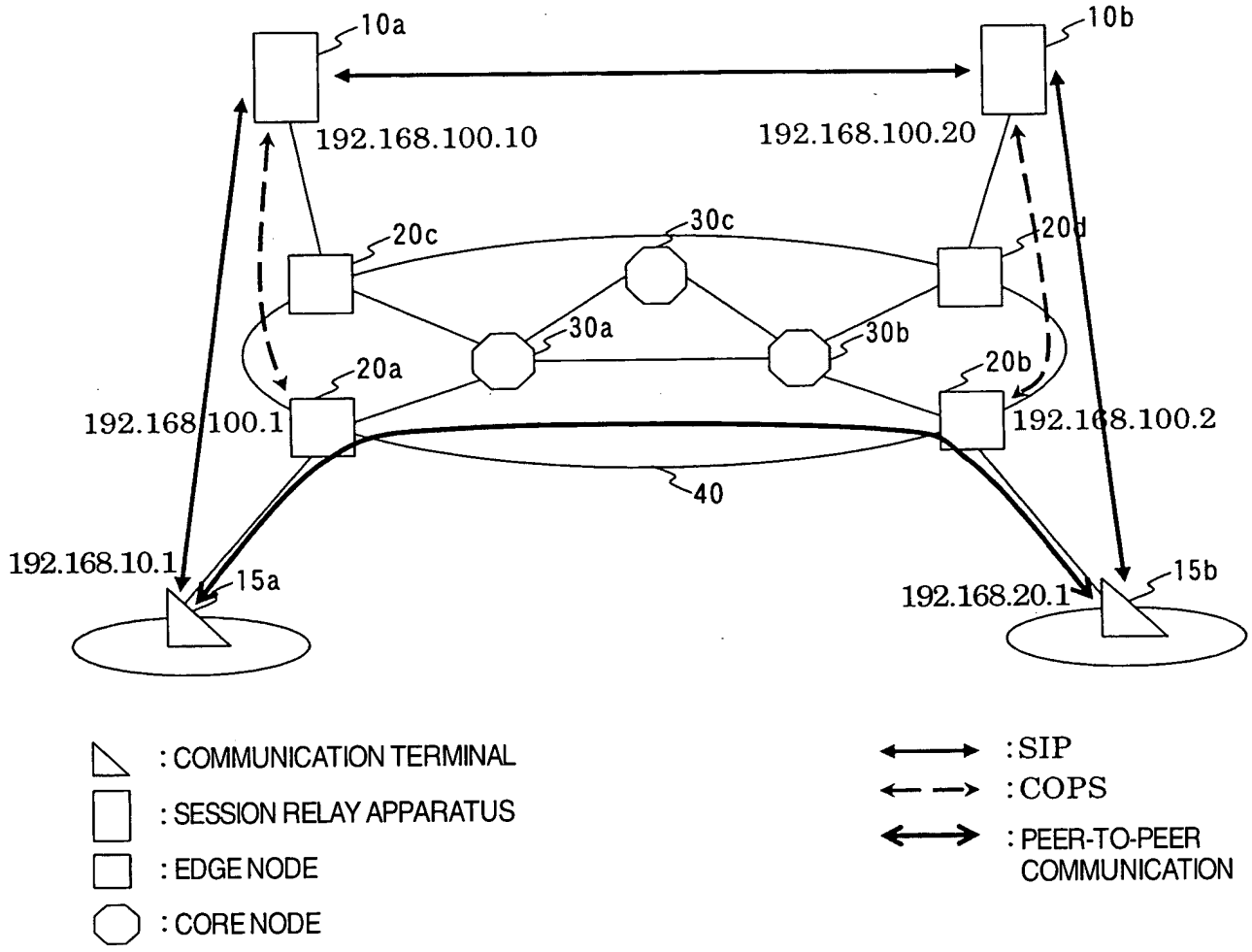

10a
10b
192.168.100.10
192.168.100.20
20c
30c
20d
30a
30b
20a
20b
192.168.100.1
192.168.100.2
40
192.168.10.1
15a
192.168.20.1
15b
: COMMUNICATION TERMINAL
: SESSION RELAY APPARATUS
: EDGE NODE
: CORE NODE
: SIP
: COPS
: PEER-TO-PEER COMMUNICATION

FIG.3

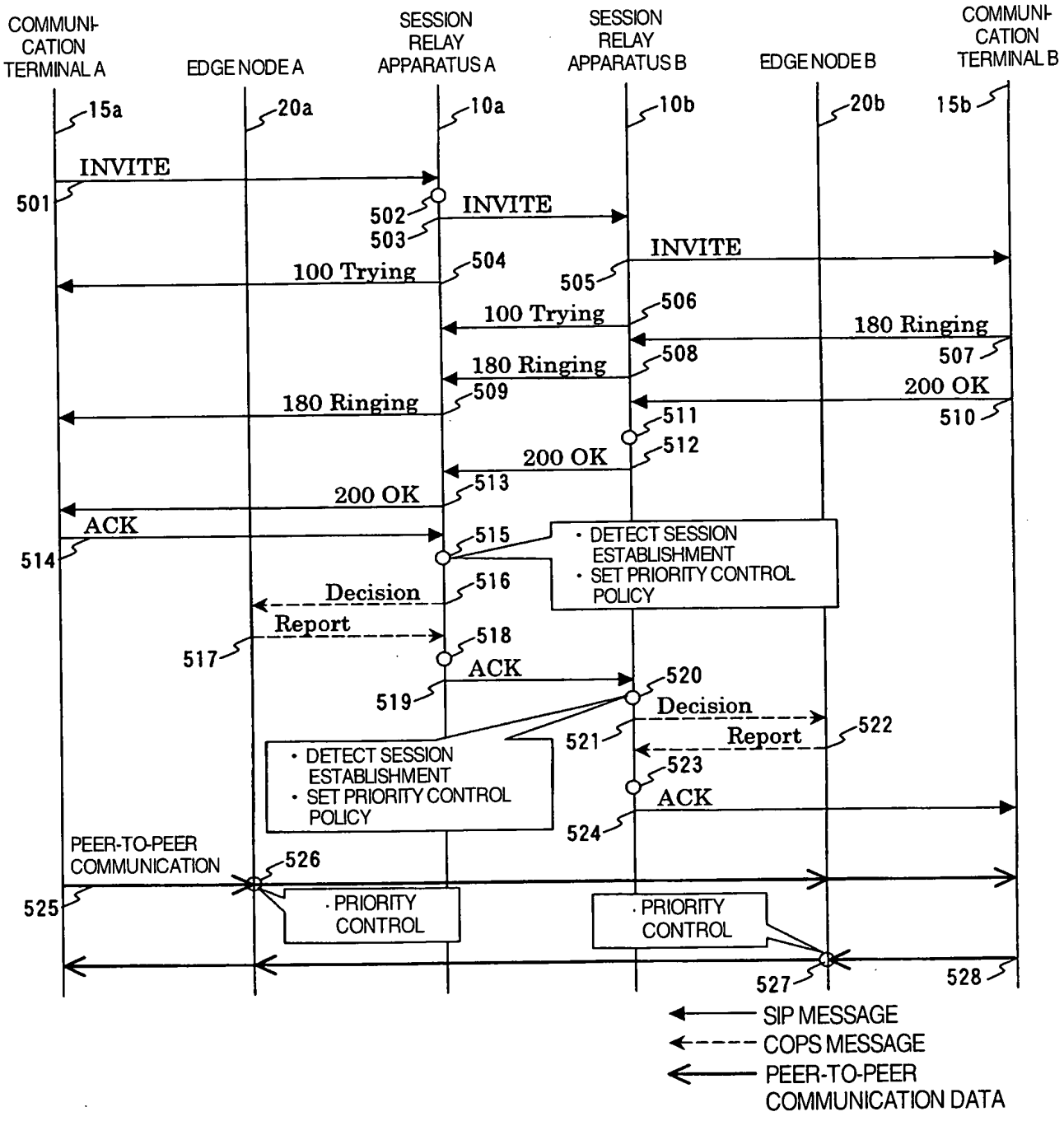

COMMUNICATION TERMINAL A
EDGE NODE A
SESSION RELAY APPARATUS A
SESSION RELAY APPARATUS B
EDGE NODE B
COMMUNICATION TERMINAL B
15a
20a
10a
10b
20b
15b
INVITE
501
502
INVITE
503
INVITE
505
100 Trying
504
100 Trying
506
180 Ringing
507
180 Ringing
508
200 OK
510
180 Ringing
509
511
200 OK
512
200 OK
513
ACK
514
515
• DETECT SESSION ESTABLISHMENT
• SET PRIORITY CONTROL POLICY
Decision
516
Report
517
518
ACK
519
520
Decision
521
Report
522
523
ACK
524
• DETECT SESSION ESTABLISHMENT
• SET PRIORITY CONTROL POLICY
PEER-TO-PEER COMMUNICATION
526
525
· PRIORITY CONTROL
· PRIORITY CONTROL
527
528
SIP MESSAGE
COPS MESSAGE
PEER-TO-PEER COMMUNICATION DATA

FIG.4

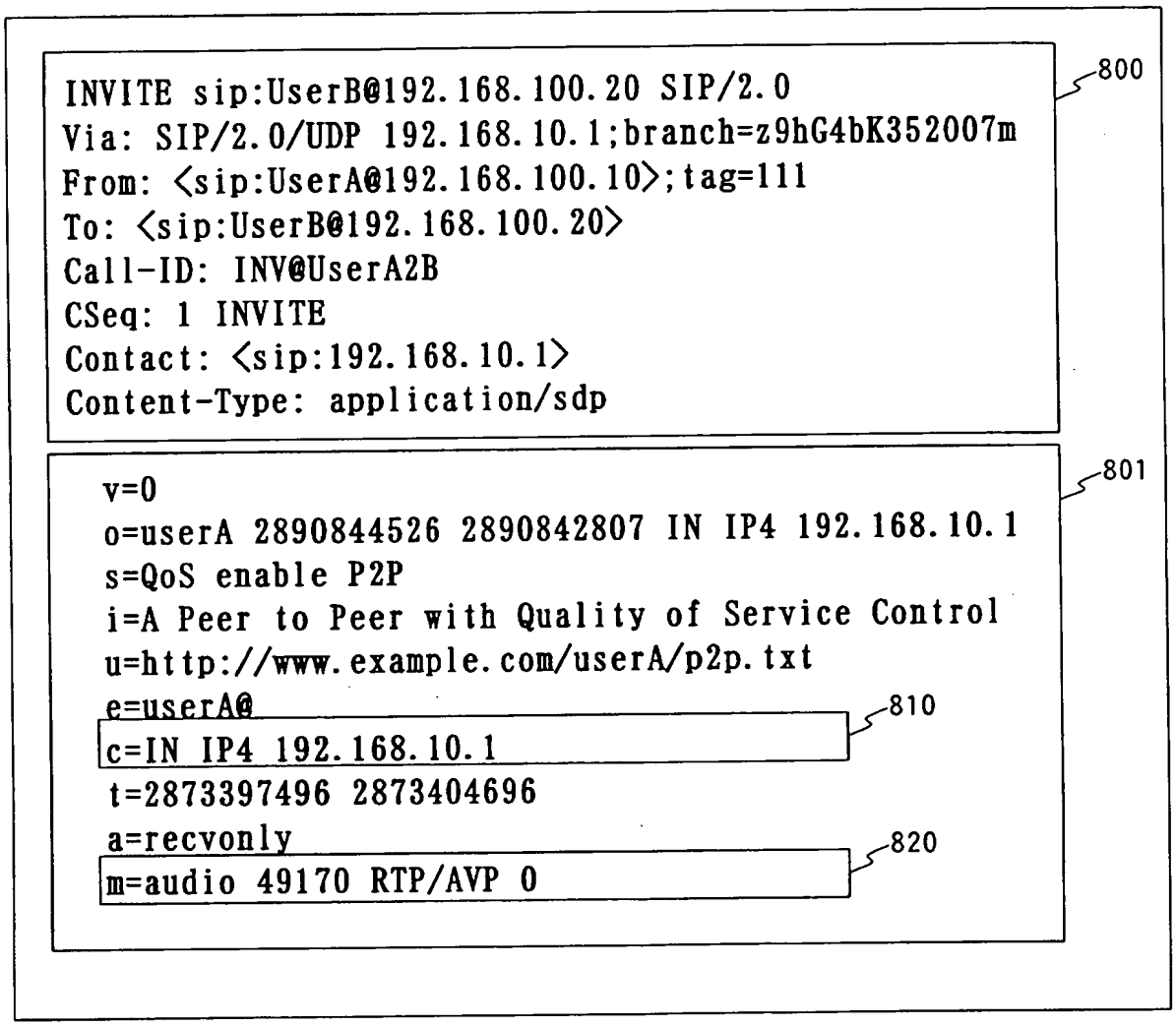

INVITE sip:UserB@192.168.100.20 SIP/2.0
Via: SIP/2.0/UDP 192.168.10.1;branch=z9hG4bK352007m
From: <sip:UserA@192.168.100.10>;tag=111
To: <sip:UserB@192.168.100.20>
Call-ID: INV@UserA2B
CSeq: 1 INVITE
Contact: <sip:192.168.10.1>
Content-Type: application/sdp
800
v=0
o=userA 2890844526 2890842807 IN IP4 192.168.10.1
s=QoS enable P2P
i=A Peer to Peer with Quality of Service Control
u=http://www.example.com/userA/p2p.txt
e=userA@
c=IN IP4 192.168.10.1
t=2873397496 2873404696
a=recvonly
m=audio 49170 RTP/AVP 0
801
810
820

FIG.5

220a

Call-ID	To tag	From tag	TRANSMITTER ADDRESS	TRANSMITTER PORT	DESTINATION ADDRESS	DESTINATION PORT	DSCP VALUE	RELAY NETWORK
INV@UserA2B	946	111	192.168.10.1	49170	192.168.20.1	49171	0x001010	—
...	...	...	...	...	...	...	...	...

FIG.6

230a

COMMUNICATION TERMINAL IP ADDRESS	EDGE NODE IP ADDRESS
192.168.10.1	192.168.100.1
...	...

FIG.7

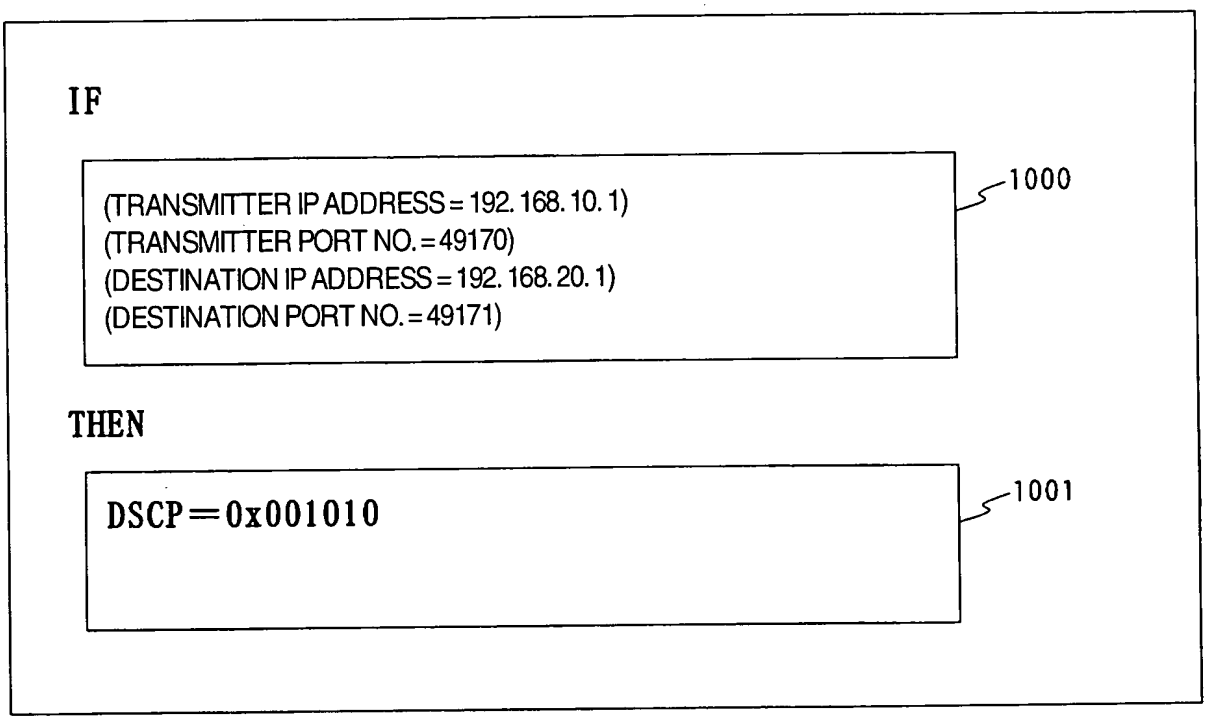

IF
(TRANSMITTER IP ADDRESS = 192. 168. 10. 1)
(TRANSMITTER PORT NO. = 49170)
(DESTINATION IP ADDRESS = 192. 168. 20. 1)
(DESTINATION PORT NO. = 49171)
1000
THEN
DSCP = 0x001010
1001

FIG.8

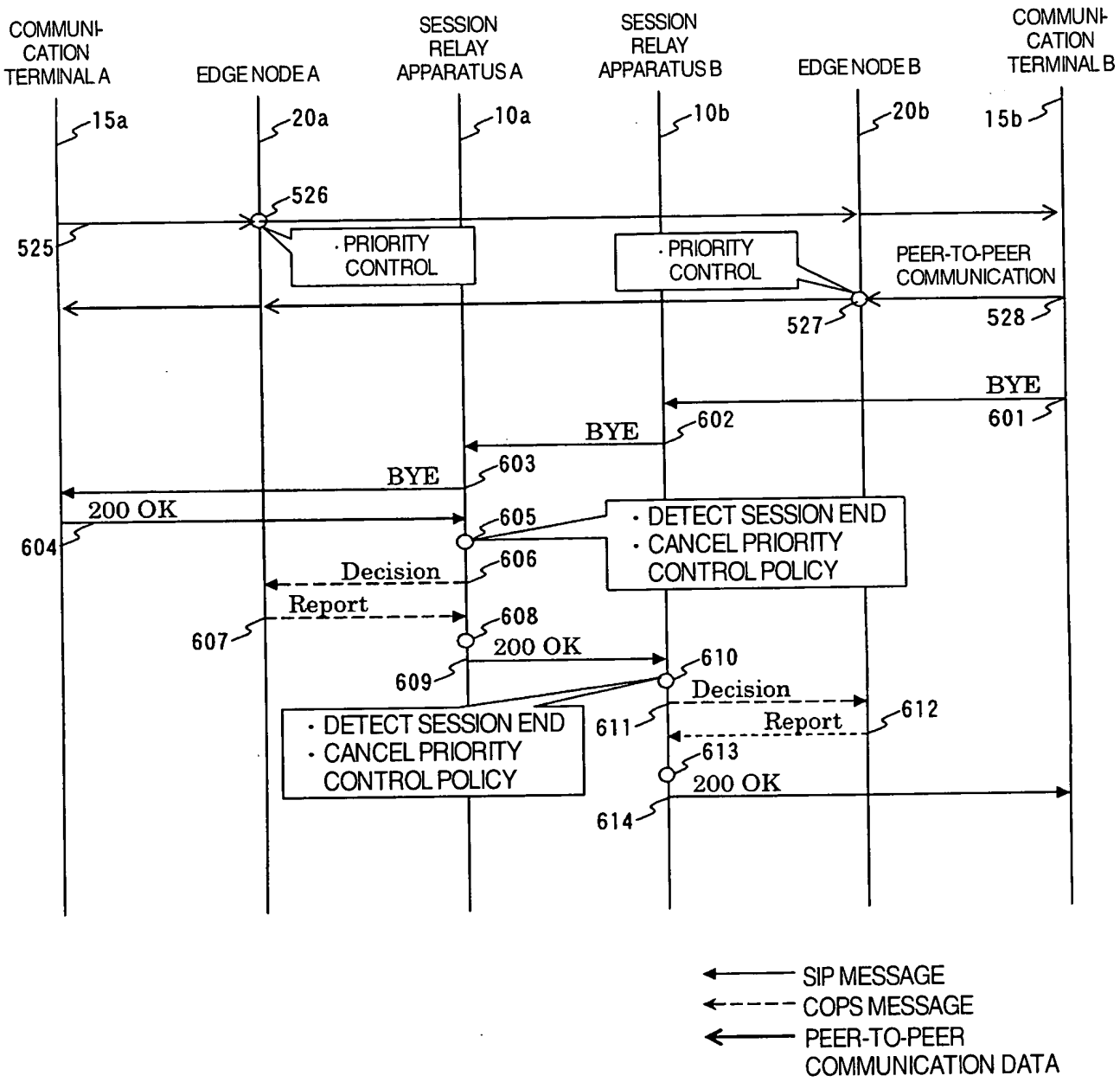

COMMUNICATION TERMINAL A
EDGE NODE A
SESSION RELAY APPARATUS A
SESSION RELAY APPARATUS B
EDGE NODE B
COMMUNICATION TERMINAL B
15a
20a
10a
10b
20b
15b
526
525
· PRIORITY CONTROL
· PRIORITY CONTROL
PEER-TO-PEER COMMUNICATION
527
528
BYE
601
BYE
602
BYE
603
200 OK
604
605
· DETECT SESSION END
· CANCEL PRIORITY CONTROL POLICY
Decision
606
Report
607
608
200 OK
609
610
Decision
611
Report
612
· DETECT SESSION END
· CANCEL PRIORITY CONTROL POLICY
613
200 OK
614
SIP MESSAGE
COPS MESSAGE
PEER-TO-PEER COMMUNICATION DATA

FIG.9

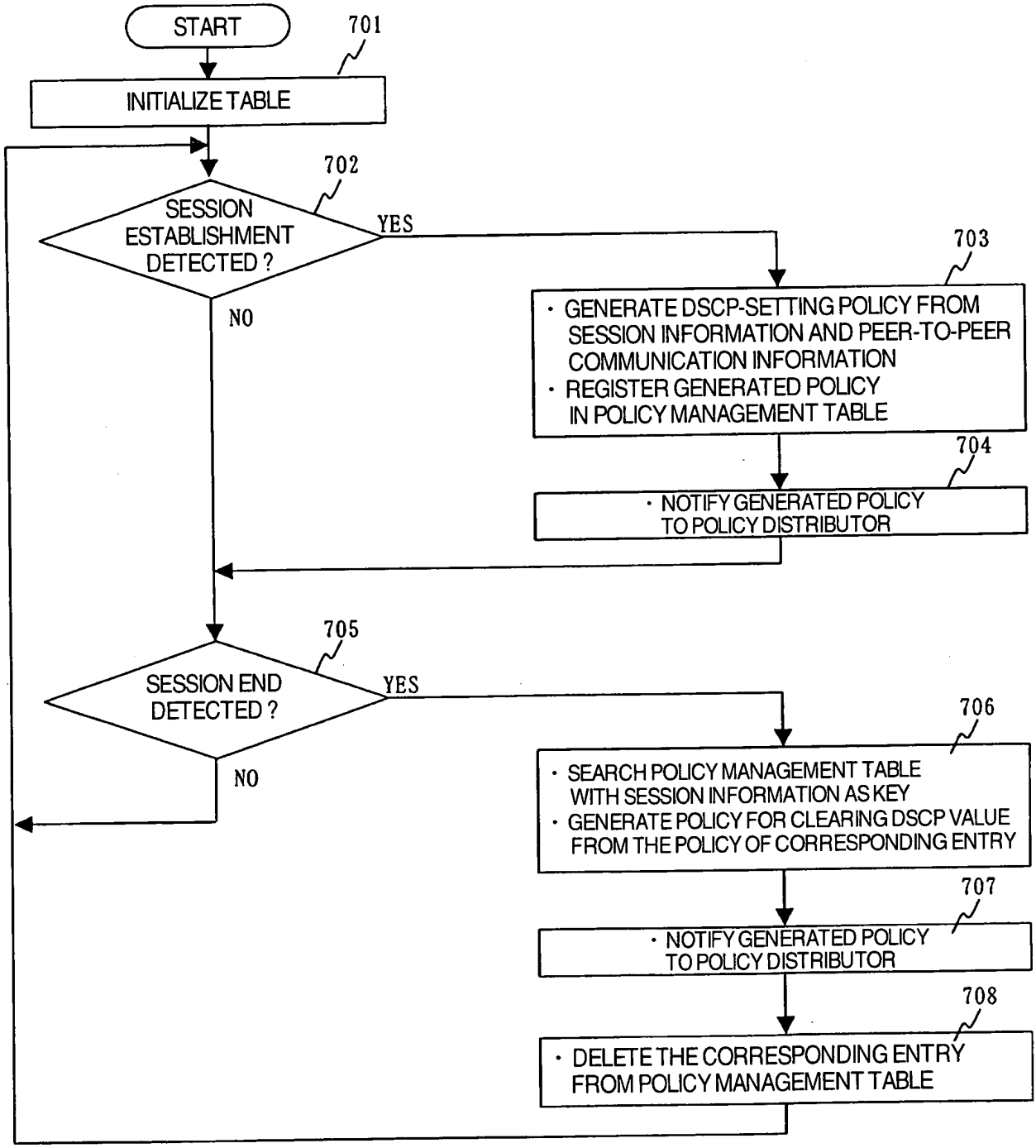

START
701
INITIALIZE TABLE
702
SESSION ESTABLISHMENT DETECTED ?
YES
NO
703
· GENERATE DSCP-SETTING POLICY FROM SESSION INFORMATION AND PEER-TO-PEER COMMUNICATION INFORMATION
· REGISTER GENERATED POLICY IN POLICY MANAGEMENT TABLE
704
· NOTIFY GENERATED POLICY TO POLICY DISTRIBUTOR
705
SESSION END DETECTED ?
YES
NO
706
· SEARCH POLICY MANAGEMENT TABLE WITH SESSION INFORMATION AS KEY
· GENERATE POLICY FOR CLEARING DSCP VALUE FROM THE POLICY OF CORRESPONDING ENTRY
707
· NOTIFY GENERATED POLICY TO POLICY DISTRIBUTOR
708
· DELETE THE CORRESPONDING ENTRY FROM POLICY MANAGEMENT TABLE

FIG.10

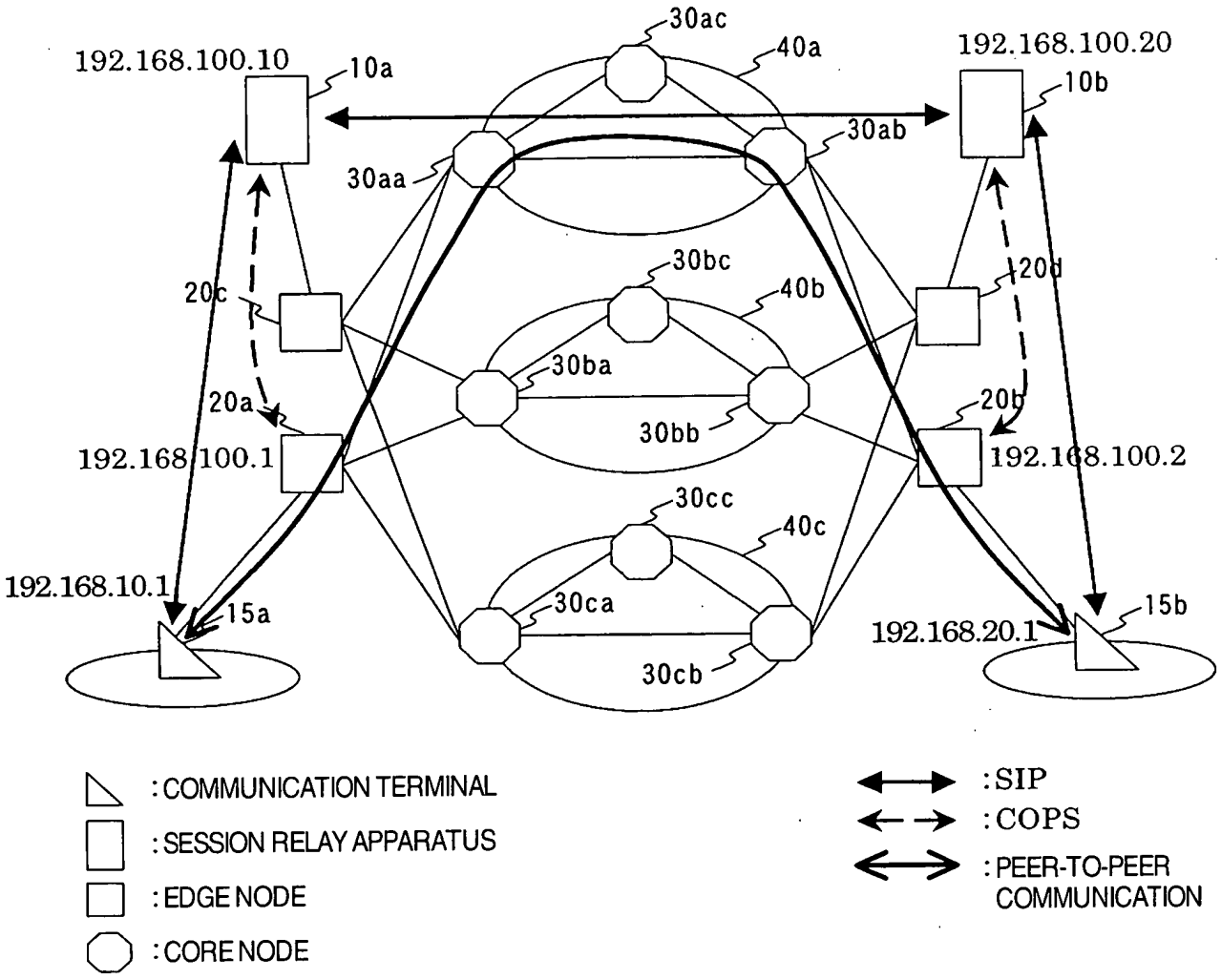
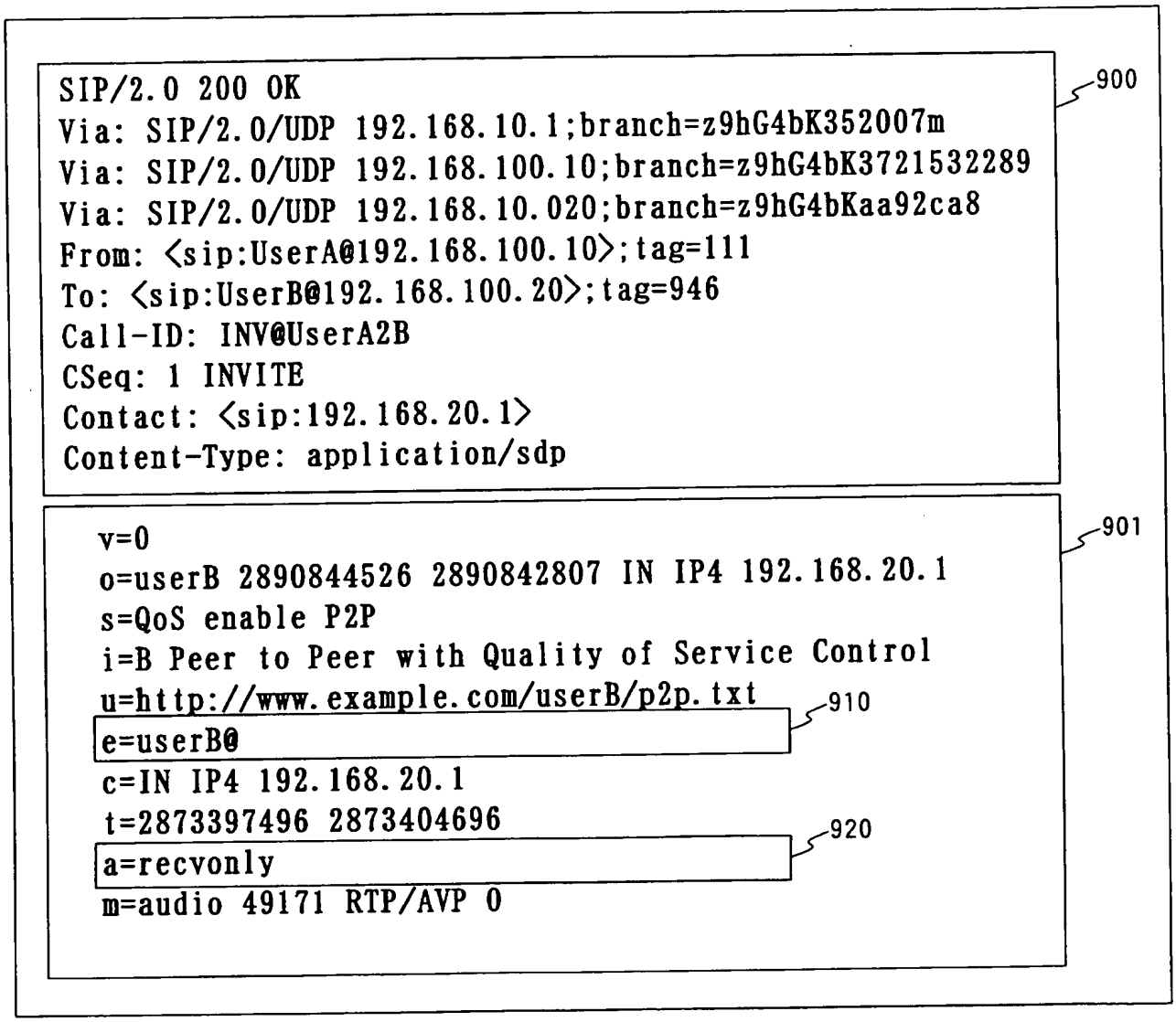

192.168.100.10
10a
30ac
40a
192.168.100.20
10b
30ab
30aa
20c
30bc
40b
20d
30ba
20a
20b
30bb
192.168.100.1
192.168.100.2
30cc
40c
192.168.10.1
15a
30ca
192.168.20.1
15b
30cb
: COMMUNICATION TERMINAL
: SESSION RELAY APPARATUS
: EDGE NODE
: CORE NODE
: SIP
: COPS
: PEER-TO-PEER COMMUNICATION

FIG.11


SIP/2.0 200 OK
Via: SIP/2.0/UDP 192.168.10.1;branch=z9hG4bK352007m
Via: SIP/2.0/UDP 192.168.100.10;branch=z9hG4bK3721532289
Via: SIP/2.0/UDP 192.168.10.020;branch=z9hG4bKaa92ca8
From: <sip:UserA@192.168.100.10>;tag=111
To: <sip:UserB@192.168.100.20>;tag=946
Call-ID: INV@UserA2B
CSeq: 1 INVITE
Contact: <sip:192.168.20.1>
Content-Type: application/sdp
900
v=0
o=userB 2890844526 2890842807 IN IP4 192.168.20.1
s=QoS enable P2P
i=B Peer to Peer with Quality of Service Control
u=http://www.example.com/userB/p2p.txt
e=userB@
910
c=IN IP4 192.168.20.1
t=2873397496 2873404696
a=recvonly
920
m=audio 49171 RTP/AVP 0
901